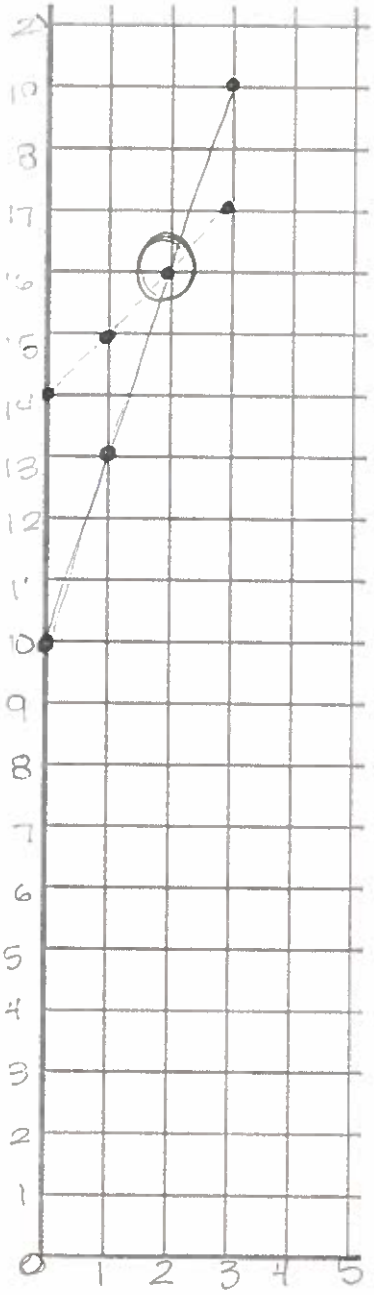
Name _____ Pd 12 Date October 3, 2017 **Section 1.C.7**

Sam's gym has a registration fee of $10, plus he pays $3 for every visit.
Write a linear equation for his gym expenses. Make a table. Make a graph.

X: Visits	Y: Expenses
0	10
1	13
2	16
3	19

$y = mx + b$
$y = 3x + 10$
$y = 3(1) + 10 = 13$



Ciara's gym has a registration fee of $14, but she only pays $1 for every visit.
Write a linear equation for his gym expenses. Make a table. Make a graph.

X: Visits	Y: Expenses
0	14
1	15
2	16
3	17

$y = mx + b$
$y = 1x + 14$
$y = 1(1) + 14 = 15$

(2, 16)
or
(16, 2)

After how many visits would Sam and Ciara have spent the same amount on their gym memberships? Find the answer by setting the equations equal to each other. Confirm your answer with the table and the graph.

Sam expenses = Ciara expenses

$3x + 10 = 1x + 14$
$-1x \quad -1x$
$2x + 10 = 14$
$-10 \quad -10$
$\frac{2x}{2} = \frac{4}{2}$
$x = 2$

(2 visits, $16)

$y = 3(2) + 10$
$y = 6 + 10 = 16$

$y = 1(2) + 14$
$y = 2 + 14 = 16$

**KEY IDEA: When you solve an equation with variables on both sides, you are finding the solution

algebraically: Use inverse operations to isolate x, then plug in x to find y.

graphically: Find the ordered pair where the lines intersect

on the table: Find the ordered pair that appears on both tables.

Special Solutions

1) Solve. $10x + 12 = 2(5x + 6)$

$10x + 12 = 10x + 12$

$-10x \quad -10x$

$12 = 12$

$0 = 0$ True

2) Solve. $3(4b - 2) = 10b - 6 + 2b$

$12b - 6 = 12b - 6$

$-12b \quad -12b$

$-6 = -6$

True

3) What do you notice about your solutions?

= # TRUE
Variable cancelled out

4) What do you notice about the original equations (after you simplify but before you solve)?

exact same on both sides

1) Solve. $9m - 4 = -3m + 5 + 12m$

$+3m \quad +3m$

$12m - 4 = 5 + 12m$

$-12m \quad -12m$

False $-4 = 5$

2) Solve. $3 + 2x + 4 = -(3 - 2x)$

$3 + 2x + 4 = -3 + 2x$

$-2x \quad -2x$

$3 + 4 = -3$

False $7 = -3$

3) What do you notice about your solutions?

= # FALSE
Variables cancelled out

4) What do you notice about the original equations (after you simplify but before you solve)?

same variables terms but different constants

Key Ideas

- Equations that look Exactly the Same on both sides are called identities.
- They have Infinitely many solutions. Any x-value, when you plug it in, would make the equation True.

$10x12 = 2(5x + 6)$ $x = 1$

$10(1)12 = 2(5(1) + 6)$

$10 + 12 = 2(5 + 6)$

$22 = 2(11)$ True.

$22 = 22$ ✓

Key Ideas

- Equations that have same variable terms but different constant terms are called contrations w/ no solution.
- They have Zero solutions. Any y-value, when you plug it in, would make the equation false.

$9m - 4 = -3m + 5 + 12m$ $m = 10$

$9(10) - 4 = -3(10) + 5 + 12(10)$

$90 - 4 = -30 + 5 + 120$

$86 = 95$ ✗ False